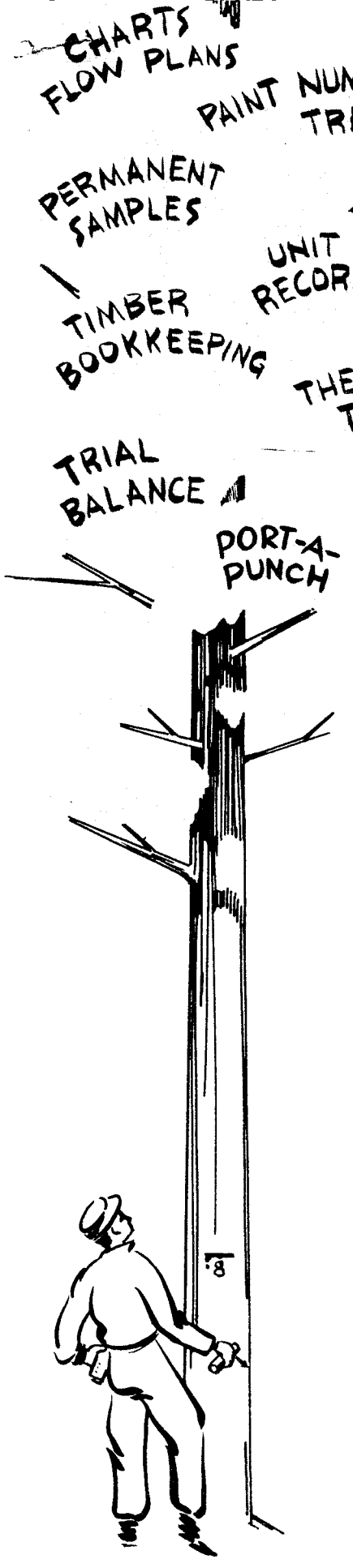


FOREST CONTROL *by* CONTINUOUS INVENTORY

"Today I have grown taller from walking with the trees."

...Karle Wilson

Milwaukee, Wis. April, 1965 No. 133

SELECTIVE CUTTING RESULTS AFTER 27 YEARS

From 1935 to 1940, Ford Motor Company selectively cut 40,500 acres of northern hardwood timber in what is now the Ford Fund Forest. Today the cut stands look fine. They are in marked contrast to surrounding clear-cut lands.

The small remnant of commercial growing stock left on these acres more than a quarter century ago gave the forest an investment value. The commercial and sub-commercial trees promised a financial return from the land within man's life span. There would be no wait of more than a hundred years for logging jobs, loggers' contracts and woods workers' pay. This kind of forest management is good for the forest, for forestry and for the local communities.

Today these forests are permanently sampled so that the growth in volume and value may be measured. The sample plots, 138 of them, were established 27 years ago when the cooperative forest management branch was just begun, and strongly supported.

These CFI plots are making a great return in knowledge and understanding of the forest and of selective cutting results. They will continue to do so as long as Ford Forestry Center exists, and the policy of selective cutting persists, on Ford Fund Forest.

I hope that both the Center and the cutting policy will still be there when travel into the vast desert of space is quite as common and pleasant as taking a walk in a good woods.

FORESTRY [illegible]
[illegible]

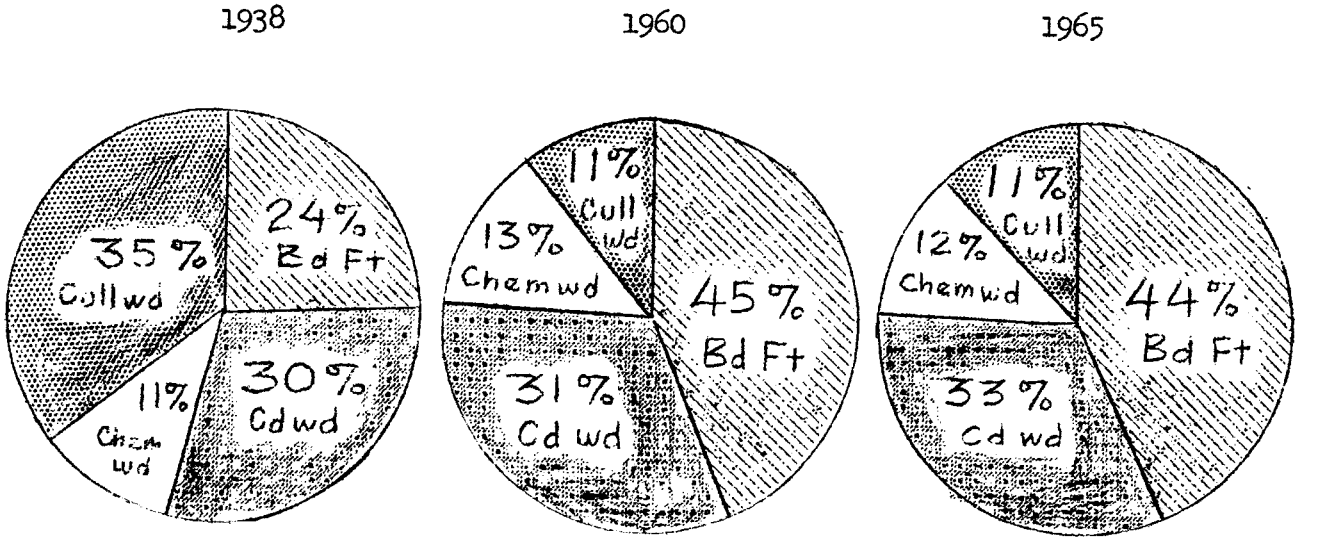
CAL STOTT

The Forester

FORD FUND FOREST

A VOLUME PICTURE OF PLOTS 41 - 42 - 43

PERCENT OF TOTAL BASAL AREA BY PRODUCT



PER ACRE VOLUME

		1938	1960	1965
	Sq. Ft. B.A.	88.8	108.6	118.7
	Trees	110.0	150.0	157.0
	Bd. Ft.	1173.7	3659.0	4396.2
	Cordwood	5.8	6.8	8.4
	Chemwood	2.0	3.4	3.6
	Cullwood	10.7	4.1	4.4

PER ACRE PER YEAR GROWTH IN VOLUME

	FIRST 22 YEARS	FULL 27 YEARS	LAST 5 YEARS
Sq. Ft. B.A.	0.90	1.11	2.00
Trees	1.82	1.73	1.33
Bd. Ft.	113.0	119.3	147.4
Cordwood *	.17	.19	.27
Chemwood	.07	.06	.03
Cullwood	- .30	- .24	.05

* SAWLOG INGROWTH TREES - When Cordwood Trees Grow into Sawlog Status, the Growth is a Bd. Ft. Gain. It is not a Cordwood Loss.

CFI MEASURES THE PRODUCTIVE POWER OF THE NORTHERN HARDWOOD FOREST AFTER HEAVY SELECTIVE CUTTING

PART I

There is much interest these days in 138 CFI plots set out 27 years ago on Ford Motor Company land near L'Anse, Michigan. A sample record of the wood growth on these plots appears in graphic form with this report. The area includes plots 41, 42 and 43 which are used to demonstrate not only the results of the continuous forest inventory but also of selective cutting as well. The study tract is south of Alberta in the NW NW of Section 5, T. 48 N., R. 33 W.

Soil, Site and Ecology

These 3 inventory samples were established in old growth northern hardwood forest land a year or two after it was heavily cut selectively. The trees within and adjacent to the plots are growing on Champion silt loam soil type, or on Baraga silt loam integrating into Champion. These are good soils for northern hardwood forest growth, but the site is only fair to middling for sugar maple, the chief species in the ecological habitat within which the plots are randomly located. Perhaps half of the growing stock is on a lower slope position topographically and the soil is not as well drained as it should be for the species. That the forest was heavy, and the cover dense in 1938, is supported by the scant understory of young growth present on two out of the three plots at the time the selective cut was made. At this time the stand averaged 8,000 to 9,000 board feet per acre, net Scribner scale.

History of Forest Treatment

The 1936 to 1937 cutting was high grading in both quality and tree size. Trees over 17" in stump diameter were seldom left to grow unless unsuited for sawlog use or not needed in the sawmill at the time the timber was marked. Very few trees less than 17" were ever cut under the Ford Motor Company selective cutting plan.

The largest commercial sawlog tree left in the sample plots was 15.5" DBH. Unusable chemwood and cullwood trees were all left uncut regardless of their size, and some were 20" to 30" in diameter. Eight cull trees per acre occupied valuable soil space when the plots were set out.

Residual trees in 1938 were irregularly arranged. Spacing was not only poor but the sawlog volume was low, there was a shortage of pole sizes, and the trees left were damaged by felling and skidding operations. In short, the stand was ragged and seemed to give little promise of adequate growth returns. Per acre volumes remaining after the selective cut included:

1174 net Scribner bd. ft. of sawlog trees
6 cords of hardwood pulp or cordwood
2 cords of chemwood
11 cords of cullwood

Since the cut was made, and the stand left to grow, there has been no cutting of any kind within or adjacent to the sample plots.

The CFI Cruise Discloses Reasonably Good Volume Growth

Visualizing physical and ecological changes in these plots over 27 years is difficult without data from the 1938, 1960 and 1965 measurements. With these records the picture comes into clear focus. It shows without doubt or reservation that despite the heavy cut sufficient trees were left, not only to protect the site, but also to provide a nucleus for reasonably good growth accumulations. Increment in quantity, quality and value has been fair to good on all plots. Because little growing stock principal was left, the board foot rate of growth in simple interest is very high. Per acre volumes added to the residual stand in 27 years include:

The 27-Year Growth

3,213 net Scribner board feet of sawlog trees
5.1 cords of hardwood pulp or cordwood
1.6 cords of chemwood

During this time 6.2 cords of cullwood per acre were lost to natural mortality. Total basal area increased 30 square feet and 47 trees 5" and larger were added to the stand per acre.

A Few Forest Management Implications

In 1938 just after selective cutting, an average basal area of 89 square feet remained uncut, but 46% of this was in cullwood and chemwood trees, which made up 69% of the total cordwood volume. Some of this would have been taken then if there had been a market, but cutting all of this poor wood in addition to the sawlogs taken in 1938 would have left only 48 square feet of basal area per acre. This is an insufficient amount to safeguard the productive power of the site. It is altogether possible that large openings inevitably resulting from a cut of this severe nature would have led to:

Site deterioration due to runoff and exposure
Flat topping or branching out of ingrowth trees
Adventitious bole branches reducing wood quality
Stump sprouting on pioneer growth after cutting

It was a wise provision of nature that some of this poor timber gradually died out naturally.

These plots not only show a good growth per acre but also a very high rate of growth. Perhaps a table of these percentage rates would indicate something of the investment possibilities of such a stand of residual timber.

The 27-Year Rate of Growth After Heavy Selective Cutting

Average Annual Rate of Growth in Board Foot Volume - 10.2%
Average Annual Rate of Growth in Board Foot Value - 41.8%

Average Annual Rate of Growth in Cordwood & Chemwood Volume - 3.2%
Average Annual Rate of Growth in Cordwood & Chemwood Value - 12.1%

Continued mortality and a slowing down of diameter growth, as measured by the plot records, give evidence that the need for follow-up cutting operations is overdue. Repeat measurements indicate that this relogging should have been done 10 to 15 years after the first cut. Impractical then because of the small volume of low grade sawlogs available, and because hardwood pulpwood and chemwood markets were lacking, the second selective cut should have been made as soon as the minor products market developed about 10 years ago. The quantities of wood on hand in this woods 10 years ago can be roughly interpolated from this CFI tabulation.

WOOD AVAILABLE FOR POSSIBLE CUT PER ACRE AT EACH CFI MEASUREMENT

HEAVY SELECTIVE CUTTING

Year	Board Feet	Chemwood & Cordwood	Cullwood
1938	314	3.6	3.6
1960	536	5.3	2.0
1965	1,052	5.8	2.2

There would also be a cord or two of topwood per acre

Chemwood is in large part salable today, and was also in 1960. The tabulated cullwood volumes given include only one-third of the gross scale of the trees. This, too, is salable wood today.

These volumes come from trees of low vigor, high risk and heavy cull. They are not good growing stock trees and their removal today is desirable. These poor trees are great spacers and cutting them would speed up the growth of the interspersed good trees remaining, but it is seldom desirable to cut all of the poor trees. The reason for this is shown by a simple tabulation of basal areas.

BASAL AREA PER ACRE AFTER HEAVY SELECTIVE CUTTING

Year	Basal Area Left	Basal Area of Poor Trees	Basal Area of Good Trees
1938	89	54	34
1960	109	46	63
1965	119	54	65

To have removed all poor trees in 1938 might have seriously affected the site, the tree form and quality wood production, for only 34 square feet of basal area in unevenly spaced trees would have remained. However, by 1965 almost all of these trees of low vigor, high risk and heavy cull might very well be removed to the immense benefit of the stand.

CAL STOTT
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